

REMARKS

The application has been amended.

New claims 44-49 have been added. These claims correspond to claims 5-7, 9, 28, and 41 and depend from claim 2.

The application is believed to be in condition for allowance. Should there be any remaining issues, an interview is requested where one of the applicants can participate.

Claims 1-43 were pending. Claims 1-12 and 23-43 were examined, claims 13-22 having been withdrawn.

As amended, all the claims are believed to read on the elected embodiment. Since claims 13-22 are believed to read on the elected embodiment, it is requested that these claims be examined.

Claim 1, lines 10-13, was objected to for not explicitly stating that the items (i) and (ii) in lines 14-23 are two substeps of the limitation in lines 10-13.

Claims 1-12 and 23-43 were rejected as indefinite.

The claims have been amended to address the stated bases for objection/rejection. Withdrawal of the objection/rejection is therefore solicited.

As an initial matter, note that according to claim 1, the transducer's position and/or orientation is determined with respect to at least two degrees of freedom relative to the environment by receiving optical signals from at least two signal sources in the environment and by calculating and using

directions of sight lines extending between the signal sources and the transducer.

Applicants would like to very much emphasize that the determination of position and/or orientation by angle measurements is fundamental to the invention and very different from distance measurements according to prior art. In prior art, distances are measured by measuring the propagation time of signals.

Thus, the wording "to determine...angles of rotation (α , β , γ)" has been deleted in claim 1, since "the determination with respect to at least two degrees of freedom" is already recited, and further any use of translation coordinates (x , y , z) or angles of rotation (α , β , γ) is only one possible way to express the result from the position and/or orientation determination.

The position and/or orientation is not determined through the use of translation coordinates or angles of rotation. Rather, the result of the angle measurements may be expressed in terms of translation coordinates and angles of rotation.

Furthermore, one must use at least two signal sources to enable the determination of position and/or orientation with respect to at least two degrees of freedom.

However, in a case where several signal sources (for example, hundreds of signal sources) are used, it is only necessary to calculate and use the direction of the respective sight line extending between the transducer and at least two of

the signal sources, that is to say; one can calculate and use two or more sight lines to determine the position and/or orientation with respect to two degrees of freedom.

To avoid misinterpretation of the claims, the wording "...a direction of each sight line extending between each respective signal source and the transducer" is replaced by "...directions of sight lines extending between respective signal source and the transducer, with respect to at least two of said at least two signal sources".

Accordingly, claim 1 and claims 2, 13, 16 and 20 have been amended.

In addition, in claims 16 and 20, the wording "at least two" is added before "signal sources...".

As regards claim 5, the wording "said operating step..of rotation (α , β , γ)" is deleted. The only feature added by claim 5 is that the position and/or orientation is repeatedly determined with respect to at least two degrees of freedom (in the same way as in claim 1).

As regards claim 6, the wording "said operating step..of rotation (α , β , γ)" is deleted. The only feature added by claim 6 is that the position and/or orientation is determined relative to a preceding position and/or orientation of the creature (in the same way as in claim 1).

In claim 29, the reference numeral "7" is replaced by "6".

In claim 37, the reference numeral "13" is replaced by "11".

The previous expression "and/or" (together with the limitation "at least two degrees of freedom") is meant to cover determination of at least two degrees of freedom related to the position, or one degree of freedom related to the position and one related to the orientation, or two degrees of freedom related to the orientation. By other words: "Any set of two or more degrees of freedom selected from total possible six (three lateral and three angular) degrees of freedom" is to be determined.

In the amended claims, the wording "position and/or orientation" is replaced by "at least two spatial degrees of freedom" in order to overcome the objection. The amendment is supported by the description on page 4, line 11 to page 5, line 2.

Claims 1-12 and 23-43 were rejected as obvious over STEINBRECHER 6,665,631.

Enclosed is a certified copy of the priority application SE 0101807-6 filed May 18, 2001 as well as a verified English-language translation of the priority application. This perfects applicants' claim of priority to May 18, 2001.

STEINBRECHER was filed on September 27, 2001 and is therefore not prior art to the present invention.

Further, STEINBRECHER does not render obvious the present invention.

Although STEINBRECHER is not citable because the present application is entitled a priority date of May 18, 2001 (which is prior to STEINBRECHER), applicants would like to stress that STEINBRECHER does not render obvious the invention.

The system described in STEINBRECHER measures the distance to an object based on the propagation time of the signals, whereas in the method according to the invention, calculation of the sight lines is accomplished, i.e., angles are determined, not distances.

To enable calculation of the sight lines (angle determination), the invention suggests two different ways:

1. The relative positions of the signals received on the transducer's detector surface are measured. This can be accomplished by means of reproducing a picture of the environment on, for example, the detector chip of a video camera of CCD-type using a wide-angle lens. Thereafter, the directions of the sight lines can be derived from the current relative positions (in the picture) of the signal sources.

2. The relative directions of the signals received are directly measured. This can be accomplished by means of a phased array. Thereafter, the directions of the sight lines can be derived from the current relative directions.

In the present independent claim 1, the features "recording the relative incident positions of the received signals on a surface of the transducer" and "based on the recorded relative positions of the received signals calculating and using directions of sight lines" distinguish the invention from the cited prior art.

In the present independent claim 2, the features "phased array" and "based on the recorded relative directions of the received signals calculating and using directions of sight lines" distinguish the invention from the cited prior art.

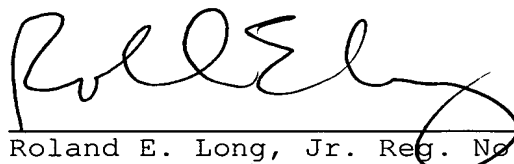
Independent claims 13, 16, and 20, both angle measurements according to 1) and 2) are possible.

Reconsideration and allowance of all the claims are therefore respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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Appendix:

The Appendix includes the following items:

- certified copy of the priority application SE 0101807-6 filed May 18, 2001 as well as a verified English-language translation of the priority application.